SulTRAC

July 26, 2013

Ms. Sheila Desai
Remedial Project Manager
U.S. Environmental Protection Agency
77 W. Jackson Blvd. (SR-6J)
Chicago, Illinois 60604

Subject: **Technical Review Comments on Feasibility Study Report**
Plainwell Mill Site, Operable Unit 7 of
Allied Paper/Portage Creek/Kalamazoo River Site
Plainwell, Kalamazoo County, Michigan
Remedial Action Contract (RAC) 2 No. EP-S5-06-02
Work Assignment No. 141-RSBD-059B

Dear Ms. Desai:

SulTRAC has reviewed the above-referenced document as part of its oversight activities regarding the Plainwell Mill Site in Plainwell, Michigan. The Feasibility Study (FS) report dated June 2013 was prepared by Conestoga-Rovers & Associates, Inc., for Weyerhaeuser Company, the responsible party for the site. The FS report presents remedial alternatives considered for implementation based on findings of the 2009 remedial investigation (RI) as presented in the RI report dated June 2011.

SulTRAC reviewed the document to assess its technical adequacy and to evaluate whether it is consistent with U.S. Environmental Protection Agency (EPA) guidance for conducting remedial investigations and feasibility studies. Enclosed are SulTRAC's technical review comments on the FS document, and separate review comments on Appendices to the FS including the human health risk assessment calculations (Appendix B), ecological risk assessment calculations (Appendix C), and remedial alternative cost estimates (Appendix E).

If you have any questions about this submittal, please call me at (312) 201-7491.

Sincerely,

Jeffrey Lifka, CHMM
SulTRAC Project Manager

Enclosures (4)

cc: Parveen Vij, EPA Contracting Officer (letter only)
Mindy Gould, SulTRAC Program Manager
Eric Morton, SulTRAC Human Health Risk Assessor
David Homer, SulTRAC Ecological Risk Assessor
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ENCLOSURE 1

**TECHNICAL REVIEW COMMENTS ON FEASIBILITY STUDY REPORT
PLAINWELL MILL SITE, OPERABLE UNIT 7 OF
ALLIED PAPER/PORTAGE CREEK/KALAMAZOO RIVER SITE
PLAINWELL, KALAMAZOO COUNTY, MICHIGAN**

(Six Pages)

TECHNICAL REVIEW COMMENTS ON FEASIBILITY STUDY REPORT
PLAINWELL MILL SITE, OPERABLE UNIT 7 OF
ALLIED PAPER/PORTAGE CREEK/KALAMAZOO RIVER SITE
PLAINWELL, KALAMAZOO COUNTY, MICHIGAN

Under Contract No. EP-S5-06-02, Work Assignment No. 141-RSBD-059B, SulTRAC was requested by the U.S. Environmental Protection Agency (EPA) to review the feasibility study (FS) report for the Plainwell Mill Site in Plainwell, Michigan. As required by the Consent Decree, the FS report dated June 2013 was prepared by Conestoga-Rovers & Associates, Inc., (CRA) for Weyerhaeuser Company (Weyerhaeuser), the responsible party for the site. The FS report presents remedial alternatives considered for implementation based on findings of the 2009 remedial investigation (RI) presented in the RI report dated June 2011. SulTRAC reviewed the document to assess its technical adequacy and whether the report is consistent with current EPA RI/FS guidance for conducting RIs and FSs.

SulTRAC's general and specific comments are presented below. The first complete paragraph on each page is identified as "Paragraph 1." An incomplete paragraph at the top of a page (one that carries over from the previous page) is identified as "Paragraph 0."

GENERAL COMMENTS

1. The FS report includes alternatives proposing soil excavation within areas with contaminant concentrations above residential/non-residential preliminary remediation goals (PRG) for land-use-based criteria, and alternatives proposing soil excavation within areas with contaminant concentrations above residential PRGs. The report however, only includes one figure (Figure 3.1) showing conceptual areas of impacted soil above PRGs. The FS report should be revised to include separate figures showing (1) conceptual areas of impacted soil above residential/nonresidential (land-use) PRGs and (2) conceptual areas of impacted soil above residential PRGs. Separate figures are necessary because the first scenario assumes 9,690 cubic yards of soil would be excavated and the second scenario assumes 22,570 cubic yards of soil would be excavated.

2. The title of Alternatives 2a and 2b are "excavation, consolidation and capping with groundwater monitoring for mixing zone-based evaluation" and "excavation, consolidation and capping with groundwater monitoring for mixing zone-based evaluation and MNA," respectively. Although some soil would be consolidated and capped on site, consolidation applies only to inorganic-impacted soil; soil impacted with volatile organic compounds (VOC), semivolatile organic

compounds (SVOC), and polychlorinated biphenyls (PCB) would be disposed of off site. The titles and descriptions of these alternatives throughout the report should be revised to reflect that off-site disposal is also a component of these alternatives.

3. One component of Alternatives 2a and 2b is consolidation and capping. Minimal information is provided with respect to the capping component. The FS report should be revised to show the conceptual location or locations of on-site consolidation, and to describe the anticipated cap construction to better support the cost estimates and the statement that the alternatives "comply with ARARs."

4. The "3" series alternatives (3a and 3b) include alternatives proposing soil excavation within areas with contaminant concentrations above residential/non-residential PRGs for land-use based criteria. The "4" series alternatives (4a and 4b) include alternatives proposing soil excavation within areas with contaminant concentrations above residential PRGs. The text in Section 4 should provide the basis or rationale for proposing two different soil cleanup goals.

5. The "a" alternatives include groundwater monitoring for mixing zone-based evaluation, and the "b" alternatives include groundwater monitoring for mixing zone-based evaluation and monitored natural attenuation (MNA). The text in Section 4 should provide the basis or rationale for proposing two different groundwater monitoring programs.

6. The descriptions of all the "a" series alternatives in Section 4 state that completion of a mixing zone-based evaluation and monitoring program would be implemented to achieve Remedial Action Objectives (RAO) 2, 6, and 7. It is not clear as to how a mixing zone-based evaluation and monitoring program would eliminate potential for leaching of contaminants from soil to groundwater as stated in RAO 2. The text throughout Section 4 should be revised to clarify this statement.

7. The descriptions of all the "a" series alternatives in Section 4 state that completion of a mixing zone-based evaluation and monitoring program would be implemented to achieve RAOs 2, 6, and 7. It is not clear as to how a mixing zone-based evaluation and monitoring program would prevent human exposure to groundwater as stated in RAO 6. The text throughout Section 4 should be revised to clarify this statement.

8. Under individual analysis of alternatives (presented in Section 5.2), the text is too vague regarding how each alternative complies with applicable or relevant and appropriate requirements (ARAR). The statement that each alternative "complies with ARARs as identified in Table 2.1"

provides little insight as to compliance with specific ARARs during remedy implementation. As one example, the 2-series alternatives include consolidation and capping of some soil on site, yet the type of cap to be used is not discussed; therefore, compliance with ARARs cannot be evaluated. Thus, the text should be revised to provide details on how each alternative complies with ARARs.

9. The detailed analysis of alternatives presented in Section 5.2 evaluates each alternative relative to meeting containment objectives. The text should clarify that using a mixing zone evaluation and groundwater monitoring program to evaluate groundwater discharge to surface water does not in and of itself meet the containment objective. The monitoring component of each alternative is a means to evaluate whether containment has been achieved by other components of the alternatives. Therefore, monitoring would simply trigger any contingency measures if contaminants of concern are shown to be migrating from groundwater to surface water. The text should be revised to provide this clarification.

10. The detailed analysis of alternatives presented in Section 5.2 evaluates each alternative relative to meeting restoration objectives. Further explanation is needed as to how the "a" series alternatives that contain a mixing zone-based evaluation and monitoring program component (as opposed to the "b" series alternatives that also contain an MNA component) will suffice for demonstrating that groundwater has been restored at and beyond the point of compliance to its beneficial use within a reasonable timeframe.

11. The detailed analysis of alternatives presented in Section 5.2 evaluates each alternative relative to its implementability. The text states that limited asbestos abatement within some of the former Mill buildings would be required. No previous discussion of asbestos abatement appears in the report. The descriptions of each alternative presented in Section 4 should be revised to discuss potential asbestos abatement and associated work within any buildings.

12. The FS does not select or recommend a remedial alternative. The FS should recommend a preferred alternative for EPA to consider.

SPECIFIC COMMENTS

1. **Section 2.2.2, Pages 36 and 37**. Section 2.2.2 summarizes the development of site-specific, risk-based arsenic PRGs. Section 2.2.2 should be revised to summarize Appendix B as revised to address EPA comments on Appendix B (see Enclosure 2).

2. **Section 3.1.1, Page 41, Bullet 4**. Soil general response actions (GRA) are identified as bulleted items. The "excavation" GRA should be renamed "excavation and disposal" or a new "disposal" GRA should be included and the text revised accordingly to discuss excavation and disposal separately.

3. **Section 3.2.1, Page 43, Paragraph 3**. This paragraph discusses the areas to be remediated for arsenic and refers to Appendix B for development of risk-based concentrations for arsenic. The text then goes on to refer to information "presented in the above table"; however, no tables are included in this section. The text should be revised to state what the actual arsenic risk-based concentration is, and delete the reference to "the above table" or include the table under discussion.

4. **Section 4.2.2, Page 64, Paragraph 5**. This paragraph states that the 2-series and 3-series alternatives would require institutional controls to be effective. The FS report should be revised to move this discussion under Section 4.2.1 (Effectiveness) rather than Section 4.2.2 (Implementability).

5. **Section 5.1.2, Page 67, Item 7**. The text states that the cost estimates do not include costs associated with predesign activities. Although the predesign costs are not expected to impact the overall cost estimates relative to the +50/-30 percent accuracy range required in an FS, the predesign activities are different for the 2-, 3-, and 4-series alternatives and should be presented in the FS report. In addition, the text should explain why a 4 percent discount rate was selected for calculating net present value costs. If the discount rate changes upon further consideration, the text and cost tables presented in Appendix E should be revised accordingly.

6. **Section 5.2.1, Page 69, Paragraph 0**. This paragraph discusses the long-term effectiveness of the no action alternative. The text states that groundwater contamination would continue to be reduced through natural attenuation occurring at the site. The text should be revised to state that groundwater contamination would "likely" or "potentially" be reduced through natural

attenuation; however, the effects of MNA would be unknown, as groundwater would not be monitored.

7. **Section 5.2.3.1, Page 78, Paragraph 1**. This paragraph evaluates Alternative 3a with respect to overall protection of human health and the environment. The text states that the alternative provides overall protection through removal and off-site disposal of VOC-, SVOC-, and/or PCB-impacted soil. The text should be revised to state that this alternative also addresses inorganic-impacted soil. This revision is also required for the evaluation of Alternatives 3b, 4a, and 4b.

8. **Section 5.2.3.1, Page 80, Paragraph 4**. This paragraph evaluates Alternative 3a with respect to short-term effectiveness. The text states that the estimated time for construction is less than 1 year, after which the containment systems should be operational and effective. Because this alternative consists of excavation and off-site disposal and groundwater monitoring, the text should be revised to explain why this discussion refers to "containment systems." This explanation is also required for evaluation of Alternatives 3b, 4a, and 4b.

9. **Section 5. 3.3, Page 93, Paragraph 5**. This paragraph provides a comparative analysis of each alternative's long-term effectiveness and permanence. The text states that the long-term effectiveness and permanence of all alternatives (other than no action) depends on the design, operation, maintenance, and monitoring of the containment systems. According to the alternative descriptions presented in Section 4, only Alternatives 2a and 2b include containment components (capping). The text should be revised to clarify what containment systems apply to Alternatives 3a, 3b, 4a, and 4b, or this statement should be modified accordingly.

10. **Section 5.3.7, Page 95, Paragraph 5**. This paragraph discusses costs associated with the remedial alternatives and refers to Table 5.1. The text should be revised to include at least a minimal discussion comparing operation and maintenance (O&M) costs associated with capping alternatives to O&M costs of non-capping alternatives. Similar discussion should also be presented comparing costs of excavation to land-use cleanup goals to costs of excavation to residential cleanup goals, as well as comparing costs of mixing zone groundwater monitoring to costs of mixing zone plus MNA monitoring.

11. **Figure 3.1**. Figure 3.1 presents conceptual areas of impacted soil above PRGs. As currently developed, Figure 3.1 presents only those arsenic locations that must be removed to meet PRGs based on a target risk (TR) of 1E-05 as described in Appendix B. As discussed in comments on Appendix B (see Enclosure 2), PRGs (identified as risk-based concentrations [RBC] in Appendix B) must be developed and evaluated based on a TR of 1E-06. Therefore, Section 3.1 must be revised or multiple versions of Figure 3.1 must be prepared showing the conceptual areas of impacted soil above PRGs based on TRs of 1E-06 and 1E-05.

ENCLOSURE 2

TECHNICAL REVIEW COMMENTS ON
APPENDIX B TO THE FEASIBILITY STUDY REPORT
PLAINWELL MILL SITE, OPERABLE UNIT 7 OF
ALLIED PAPER/PORTAGE CREEK/KALAMAZOO RIVER SITE
PLAINWELL, KALAMAZOO COUNTY, MICHIGAN

(Four Pages)

TECHNICAL REVIEW COMMENTS ON
APPENDIX B TO THE FEASIBILITY STUDY REPORT
PLAINWELL MILL SITE, OPERABLE UNIT 7 OF
ALLIED PAPER/PORTAGE CREEK/KALAMAZOO RIVER SITE
PLAINWELL, KALAMAZOO COUNTY, MICHIGAN

The errors and concerns identified by SulTRAC appear in the specific comments below. The first complete paragraph on each page is identified as "Paragraph 1." An incomplete paragraph at the top of a page (one that carries over from the previous page) is identified as "Paragraph 0." References cited in the comments are listed following the specific comments.

GENERAL COMMENTS

1. Appendix B calculates receptor-specific risk-based concentrations (RBC) of arsenic in soil based on target risks of 1E-06, 1E-05, and 1E-04, as well as a target hazard quotient (THQ) of 1. However, the proposed RBCs for each area of development are based only on the target risk (TR) of 1E-05 and THQ of 1. In turn, Appendix B and the feasibility study (FS) evaluate only those soil locations that would have to undergo removal to meet the proposed soil RBCs for arsenic. The U.S. Environmental Protection Agency (EPA) requested consideration of RBCs based on the full range of EPA's risk range of 1E-06 to 1E-04; Appendix B and the FS do not meet this request as currently presented. Appendix B and the FS should be revised to evaluate options for meeting RBCs based on the full range of EPA's risk range. (Note: RBCs based on a TR of 1E-06 as presented in Appendix B are less than the state-wide default background concentration of arsenic in soil ([5.8 milligrams/kilogram {mg/kg}] [Michigan Department of Environmental Quality {MDEQ} 2012]).

2. Appendix B develops site-specific exposure frequencies for residents and commercial/industrial workers based on consideration of adverse weather conditions. The site-specific exposure frequencies are based on consideration "of the number of days where the soil is not snow-covered (and the ground is not frozen) and it is not raining." Also, the site-specific exposure frequencies are applied equally to all potential exposure pathways (including incidental ingestion, dermal contact, and inhalation of particulates). Several problems were identified with both the development and application of site-specific exposure frequencies.

First, as described in MDEQ Remediation and Redevelopment Division (RRD) Operational Memorandum No. 1, Technical Support Document – Attachment 6, a meteorologically adjusted exposure frequency considers local weather conditions that make soil "unavailable for contact" (MDEQ 2005). Specifically, MDEQ adjusts the exposure frequencies for residents and for commercial/industrial workers to account for Michigan winter assumed to last 4 months (120 days) during which snow cover and frozen soil make soil "unavailable for contact"; MDEQ does not recommend elimination of rainy days. Therefore, Appendix B should be revised to recalculate meteorologically adjusted exposure frequencies for both residents and commercial/industrial workers to *NOT* remove rain days from consideration. Consistent with MDEQ recommendations, the meteorologically adjusted exposure frequencies for residents and commercial/industrial workers should be specified as 245 days/year and 160 days/year, respectively (MDEQ 2005).

Second, MDEQ recommends application of the meteorologically adjusted exposure frequency only for consideration of the dermal contact exposure pathway (MDEQ 2005). Unadjusted exposure frequencies of 350 days/year and 245 days/year should be applied to the incidental ingestion exposure pathway (MDEQ 2005). Similarly, the inhalation of particulates exposure pathway should also utilize an unadjusted exposure frequency (MDEQ 2007). In particular, use of an unadjusted exposure frequency for the incidental ingestion exposure pathway reflects carriage of soils into a home or place of business that subsequently can be contacted, resulting in incidental ingestion, throughout the year, despite ambient weather conditions.

3. All RBC equations for residents and commercial/industrial workers should be revised as necessary to address revisions described in General Comment 2.

4. Appendix B refers to the November 2012 version of EPA's Regional Screening Levels (RSL). The most recent update to the RSLs is dated May 2013 (EPA 2013). Appendix B should be revised to refer to and utilize the most recent EPA RSLs.

SPECIFIC COMMENTS

1. **Section 2.1, Pages 2 through 4**. Section 2.1 presents the equations used to calculate receptor-specific RBCs. These equations should be revised to incorporate the revisions described in General Comment 2.

2. **Section 2.2.2, Site-Specific Exposure Frequency**. This section describes the basis for the site-specific exposure frequencies (particularly those for residents and commercial workers) that were adjusted to consider local meteorological conditions. This section should be revised in accordance with the revisions described in General Comment 2.

3. **Section 2.2.2, Site-Specific Absorption Factors**. This section describes use of an alternative "site-specific" dermal absorption factor that accounts for a reduced dermal absorption of arsenic from weathered soil. While the cited paper presents some interesting information for consideration, two primary factors weigh against use of the suggested alternative dermal absorption factor for arsenic. First, the standard default dermal absorption factor for arsenic in soil of 0.03 (3 percent) is well established and is regularly used throughout the risk assessment community (EPA 2004). Second, no site-specific basis for use of such an alternative dermal absorption factor is provided other than a very general statement that weathered soils "are considered to be more relevant to those soils found at the site." "Weathered" is a subjective term, and no evidence suggests that dermal absorption of arsenic from site soils will be more like the default value of 3 percent or the suggested alternative of 0.5 percent. Therefore, Appendix B should be revised to use the EPA-recommended dermal absorption factor of 3 percent (0.03) for arsenic in soil (EPA 2004).

4. **Section 2.4.2, Pages 8 through 10**. Section 2.4.2 presents the calculation and evaluation of site- and receptor-specific RBCs for arsenic in soil. This section (including Tables 3 through 16) should be revised to reflect all other recommended revisions. Also, Section 2.4.2 should present and evaluate receptor-specific RBCs that reflect the full range of TRs: 1E-06, 1E-05, and 1E-04. It should be noted that RBCs based on a TR of 1E-06 are expected to be less than the state-wide default background level of 5.8 mg/kg for arsenic in soil. Therefore, Appendix B must be further revised to add a discussion of an appropriate default background concentration of arsenic in soil.

REFERENCES

Michigan Department of Environmental Quality (MDEQ). 2005. "Remediation and Redevelopment Division (RRD), Operational Memorandum No. 1, Technical Support Document – Attachment 6, Part 201 Soil Direct Contact Criteria, Part 213 Tier I Soil Direct Contact Risk-Based Screening Levels." April. On-Line Address: http://www.michigan.gov/documents/deq/deq-rrd-OpMemo_1-Attachment6_285488_7.pdf

MDEQ. 2007. "RRD Operational Memorandum No. 1, Technical Support Document – Attachment 7, Part 201 Generic Soil Inhalation Criteria for Ambient Air, Part 213 Tier I Soil Inhalation Risk-Based Screening Levels for Ambient Air." July. On-Line Address: http://www.michigan.gov/documents/deq/deq-rrd-Op_Memo1_Attach7-SoilInhalationCleanupCriteria-TSD_285498_7.pdf

MDEQ. 2012. Revised Part 201 Cleanup Criteria and Part 213 Risk-Based Screening Levels. September 28. On-line address: http://www.michigan.gov/deq/0,1607,7-135-3311_4109_9846_30022-251790--,00.html

U.S. Environmental Protection Agency (EPA). 2004. *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)*. Final. Office of Superfund Remediation and Technology Innovation. EPA/540/R/99/005. July. On-Line Address: http://www.epa.gov/oswer/riskassessment/ragse/index.htm

EPA. 2013. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. May. On-Line Address: http://www.epa.gov/region9/superfund//prg/index.html

ENCLOSURE 3

TECHNICAL REVIEW COMMENTS ON
APPENDIX C TO THE FEASIBILITY STUDY REPORT
PLAINWELL MILL SITE, OPERABLE UNIT 7 OF
ALLIED PAPER/PORTAGE CREEK/KALAMAZOO RIVER SITE
PLAINWELL, KALAMAZOO COUNTY, MICHIGAN

(Three Pages)

TECHNICAL REVIEW COMMENTS ON
APPENDIX C TO THE FEASIBILITY STUDY REPORT
PLAINWELL MILL SITE, OPERABLE UNIT 7 OF
ALLIED PAPER/PORTAGE CREEK/KALAMAZOO RIVER SITE
PLAINWELL, KALAMAZOO COUNTY, MICHIGAN

The errors and concerns identified by SulTRAC appear in the specific comments below. The first complete paragraph on each page is identified as "Paragraph 1." An incomplete paragraph at the top of a page (one that carries over from the previous page) is identified as "Paragraph 0." References cited in the comments are listed following the specific comments.

SPECIFIC COMMENTS

1. **Appendix C, Section 3.3, Page 6, Paragraph 2**. The text describes the source for the ecological screening values used. Although the sources are listed, no hierarchy is provided. The paragraph should identify the following hierarchy for the source of the screening values with the ecological soil screening levels (EcoSSL) having the highest priority, followed by EPA Region 5 Ecological Screening Levels (mammalian only), then Efroymson et al (1997), and then the Canadian Council of Ministers of the Environment (CCME).

2. **Appendix C, Section 5.1.1, Page 9, Paragraph 2**. This section notes that background concentrations were considered in the selection of the refined avian benchmarks. The text states that if background levels are higher than the preferred screening value, the next highest screening value above background should be selected as the screening value. If background concentration exceeds the preferred screening value, then background should be used as the screening value. For the example cited in the text, the screening value for cadmium should be 0.9 mg/kg rather than the 3.8 mg/kg from the CCME. The values in Tables 5.1 and 5.2 should be revised.

3. **Appendix C, Section 5.1.2, Page 10, Paragraph 2**. The first sentence states that Table 5.3 identifies the available benchmarks for avian receptors; however, the table identifies the benchmarks for mammalian receptors. The text should be revised to match the table.

4. **Appendix C, Section 5.1.2, Page 10, Paragraph 3**. This section notes that background concentrations were considered in the selection of the refined mammalian benchmarks. The text states that if background levels are higher than the preferred screening value, the next highest screening value above background should be selected as the screening value. If background concentration exceeds the preferred screening value, then background should be used as the screening value. The values in Tables 5.3 and 5.4 should be revised.

5. **Appendix C, Section 6.3, Page 18**. This section presents the rationale for the modified remediation goals for high molecular weight polycyclic aromatic hydrocarbons (PAH), lead, mercury, and zinc. The toxicity reference values (TRV) for this site had been proposed and approved previously and should be used without modification. Numerous statements assert that the values were unrealistically low and must be revised because they resulted in PRGs lower than background. This discussion should be part of an uncertainty analysis of the PRGs rather than a modification of the TRV. Any concern with the values should have been raised earlier.

6. **Appendix C, Table 4.1**. This table shows the rescreening of the revised data set for the site. The ecological screening values (ESV) are identified, but no source information is provided. This information must be added to the table so the reader is clear as to the sources of the ESVs.

7. **Appendix C, Table 5.2**. Table 5.1 presents the refined avian ESVs. The refined ESVs for polychlorinated biphenyls (PCB) and vanadium in Table 5.2 are not consistent with the values in Table 5.1. Table 5.2 must be revised.

8. **Appendix C, Table 5.5**. The table provides the exposure parameters for the avian indicator species. The food ingestion rates are not consistent with the references provided for the American Woodcock and Mourning Dove—the values should be changed to 0.214 and 0.190 milligrams per kilogram per body weight per day (mg/kg BW/day), respectively. The proportion of soil ingested for the Mourning Dove does not match the reference provided—the value should be 0.139. Also, the table specifies that the Mourning dove feeds 100 percent on terrestrial invertebrates; however, the Mourning Dove is a granivore, and its diet should be specified as 100 percent terrestrial plants. The footnote for the "IRfood" should be changed to Table 1 rather than Table 3.

9. **Appendix C, Table 5.6**. The table provides the exposure parameters for the mammalian indicator species. The table is missing the data for the proportion of soil ingested for all three species. The values should be for the Short-Tailed Shrew, 0.03; for the Meadow Vole, 0.032; and for the Long-Tailed Weasel, 0.043. Also, the table specifies that the Meadow Vole feeds 100 percent on terrestrial invertebrates; however, the Meadow Vole is a granivore, and its diet should be specified as 100 percent terrestrial plants. The footnote for the "IRfood" should be changed to Table 1 rather than Table 3.

10. **Appendix C, Table 5.7**. The footnotes should provide a full reference to "U.S. EPA Region 10." The table identifies the source of a number of equations for calculation of constituents of potential ecological concern (COPEC) in dietary items as "e"; however, no information is provided on that source, so the equations associated with "e" could not be verified.

11. **Appendix C, Table 5.9**. The table identifies the source for the mammalian toxicity reference value for xylene as "The." The footnotes should provide a correct reference for xylene. The footnotes should provide a full reference to "U.S. EPA Region 9."

12. **Appendix C, Table 6.1**. No footnote(s) in this table identify the source(s) of the modified exposure parameters for the American Woodcock and Short-Tailed Shrew. This source information must be added to the table.

REFERENCE

Efroymson, R.A., Suter II, G.W., Sample, B.E., and Jones, D.S. 1997. Preliminary Remediation Goals for Ecological Endpoints. U.S. Department of Energy, Office of Environmental Management. ES/ER/TM-162/R2.

ENCLOSURE 4

TECHNICAL REVIEW COMMENTS ON
APPENDIX E TO THE FEASIBILITY STUDY REPORT
PLAINWELL MILL SITE, OPERABLE UNIT 7 OF
ALLIED PAPER/PORTAGE CREEK/KALAMAZOO RIVER SITE
PLAINWELL, KALAMAZOO COUNTY, MICHIGAN

(Three Pages)

TECHNICAL REVIEW COMMENTS ON
APPENDIX E TO THE FEASIBILITY STUDY REPORT
PLAINWELL MILL SITE, OPERABLE UNIT 7 OF
ALLIED PAPER/PORTAGE CREEK/KALAMAZOO RIVER SITE
PLAINWELL, KALAMAZOO COUNTY, MICHIGAN

GENERAL COMMENTS

1. The remedial alternative cost summaries in Appendix E do not provide details on assumptions or unit rates. Thus, whether the estimated costs are appropriate is unknown. The cost summaries should be expanded to provide details to account for some of the variable rates and the lump sum costs.

2. The text of the feasibility study (FS) does not provide details regarding the assumptions for each remedial alternative. The text of the FS should be revised for each remedial alternative to include assumptions and details such as soil volumes excavated, managed on site, and transported for off-site disposal. The text should also provide details on the conceptual plan for the consolidation area and the cap to be installed. Areas and volumes of materials needed for cap construction should be provided. The costs provided in the cost summary tables cannot be evaluated without provision of assumptions used to calculate those costs.

SPECIFIC COMMENTS

1. **Tables E.2.a. and E.2.b., Section A.2.0**. The cost summaries provide the costs assumed for Remedial Alternatives 2a and 2b. The capital costs included in A.2.0 specify costs for excavation by redevelopment area. The unit cost per area ranges significantly from about $16 per cubic yard to $108 per cubic yard. No justification or explanation for the variable unit rate is stated, such as differences among areas in accessibility issues, or excessive depths or difficult terrain within some areas. The cost table should be revised to use consistent unit rates or provide details on the assumptions used in determining variable unit rates.

2. **Table E.2.a.and E.2.b., Section A.3.0**. The cost summary includes lump sum costs for preparation and/or demolition by redevelopment area. No details are provided regarding these activities or how these lump sum costs were determined. The cost summary should provide details on what preparation and/or demolition activities are planned for the redevelopment areas,

so that these costs can be evaluated for appropriateness and reasonability. It is unknown if these costs include the aboveground storage tank (AST) fuel line and coal tunnel removal, or whether these costs are for asbestos abatement and shoring activities. The costs should provide assumptions such as linear feet and demolition items, at a minimum.. Thus, further detail is required regarding the elements included in the preparation and/or demolition costs.

3. **Tables E.2.a. and E.2.b. compared to E.3.a and E.3.b., Section A.3.0**. The lump sum cost for preparation and/or demolition provided in Remedial Alternative 2 differs slightly from the lump sum cost for this item in Remedial Alternative 3. Why these two remedial alternative costs differ is unclear. The assumptions are not provided to indicate the reason for the difference. Assumptions and details on these cost elements should be provided.

4. **Table E.2.a. and E.2.b, Section A.4.0**. The cost summary is for consolidation and capping of the soil exceeding residential/non-residential preliminary remediation goals (PRG). Section A.4.0 includes transportation and off-site disposal of heavily contaminated material. The volume to be transported for off-site disposal is estimated at 11,015 tons. The volume estimated to be excavated is about 14,533 tons. Thus, this alternative provides for consolidation and capping of about 3,500 tons of material, which is only about 25 percent of the material to be excavated. This information should be provided in the text of the FS.

5. **Table E.2.a. and E.2.b., Section A.5.0**. The cost summary provides lump sum costs for consolidation of soils on site. These costs should include assumptions or be provided on a unit rate basis. Details on how these costs were determined are required. Information on square footage, on-site transportation, and other material handling is needed to evaluate these costs.

6. **Table E.2.a. and E.2.b., Section A.6.0**. The cost summary provides lump sum costs for restoration of each area. Specifics of restoration activities for the areas are unclear. The text should provide a summary of the restoration activities, and the cost summary should provide square foot/acreage to be restored, materials, and the methods of the restoration.

7. **Table E.2.a. and E.2.b., Section A.7.0**. A lump sum of $200,000 for capping the soil is specified. The text and cost summary do not provide assumptions or details on the cap construction. Thus, this cost cannot be evaluated for reasonableness. The conceptual design of the cap should be provided in the text, and the cost summary should include volumes/areas and unit costs for each material to be used in the cap construction.

8. **OM&M Costs, Section B**. The operations, monitoring and maintenance (OM&M) costs of groundwater monitoring for "mixing zone based" and for "mixing zone based with monitored natural attenuation (MNA)" are provided as lump sum costs, and should be accompanied by details on underlying assumptions, such as sample numbers, types, or sampling frequency.

9. **Table E.3.a., Section A.1.0**. The costs for mobilization and setup are provided as lump sum or a monthly rate. The costs provided in this section for Remedial Alternative 3 are higher than for Remedial Alternative 2, but cover the same time duration. Remedial Alternative 3, lacking consolidation and capping of waste, would be expected to incur lower mobilization and set-up costs than Remedial Alternative 2. This cost element should be revised to represent the needs of Alternative 3.

10. **Tables E.3.a and E.3.b., Section A.3.0**. The cost for preparation and/or demolition by redevelopment area listed under Remedial Alternatives 3a and 3b differ slightly from those indicated for Remedial Alternative 2. No justification is provided for why the costs would vary between the Remedial Alternatives 2 and 3. This cost element should be revised accordingly.

11. **Tables E.3.a. and E.3.b., Section A.4.0**. The amount of soil listed is 12 tons for the cost to transport and dispose of soil from the mixed residential/commercial area 1. However, the excavation volume for this area is 12 cubic yards. Transportation and disposal cost for this area should be for 18 tons, not 12 tons.

12. **Tables E.3.a., and E.3.b., Section A.5.0**. The total estimated cost for restoration under Remedial Alternative 3 is lower than the restoration cost for Remedial Alternative 2, even though the excavation volume assumptions are the same. The restoration costs should be revised to represent the square footage of the site that will require restoration.

13. **Tables E.4.a. and E.4.b., Section A.3.0**. The costs for preparation and pre-excavation work by redevelopment area are all provided as lump sum costs. No details are provided. Thus, it is unclear if these costs represent disposal of abandoned process-related equipment and ancillary structures for each area. This section should provide details on the assumptions regarding each area, as well as units and unit rates.